

What Is Claimed Is:

1. A fabrication system, comprising:

a plurality of fabrication facilities, each of which
comprises a tool group, wherein each tool group

5 comprises a plurality of tools; and

a backup planning device assigning a virtual tool to each

of the tool groups, combining capacity of the virtual

tool into first capacity information of the tool

group to generate second capacity information

10 thereof accordingly, determining a first

manufacturing plan for the tool group according to

a master production schedule, a WIP profile, and the

second capacity information thereof, and determining

a second manufacturing plan according to the workload

15 allocation for the virtual tool in the first

manufacturing plan.

2. The fabrication system of claim 1, wherein the virtual

tool has unlimited capacity and is the least preferred tool in

the tool group.

3. The fabrication system of claim 1, wherein the backup planning device further determines a backup request tool group according to workload allocation of the virtual tool specified in the first manufacturing plan.

5 4. The fabrication system of claim 1, wherein the backup planning device further determines a backup demand, equal to the workload allocation of the virtual tool, of the backup request tool group according to the first manufacturing plan.

5. The fabrication system of claim 4, wherein the backup
10 planning device further determines a backup supply tool group and a backup supply provided therefrom according to the first manufacturing plan, the backup demand, and the master production schedule.

6. The fabrication system of claim 5, wherein the backup
15 planning device further allocates each tool of the backup supply tool group an equal share of workload gained in the backup operation.

7. The fabrication system of claim 1, wherein the backup planning device further introduces a simulated backup tool, having capacity equaling backup capacity received from the backup supply tool group, to the backup request tool group.

5 8. The fabrication system of claim 1, wherein the tool is a semiconductor manufacturing tool.

9. A backup planning system scheduling backup operations in a manufacturing system, wherein the manufacturing system comprises a plurality of manufacturing facilities, each of which
10 comprises a plurality of tool groups, and each tool group comprises a plurality of tools, the backup planning system comprising:

means for providing first capacity information, a master
production schedule, and a WIP profile of the tool
15 group;

means for assigning a virtual tool to each of the tool
groups;

means for combining capacity of the virtual tool into the
first capacity information of the tool group to

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generate second capacity information thereof
accordingly;

means for determining a first manufacturing plan for the
tool group according to the master production
5 schedule, the WIP profile and the second capacity
information thereof; and

means for determining a second manufacturing plan
according to the workload allocation of the virtual
tool in the first manufacturing plan.

10 10. The system of claim 9, wherein the virtual tool has
an unlimited capacity and is the least preferred tool in the tool
group.

11. The system of claim 9, further comprising means for
determining a backup request tool group according to workload
15 allocation of the virtual tool specified in the first
manufacturing plan.

12. The system of claim 9, further comprising means for
determining a backup demand, equal to the workload allocation

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of the virtual tool, of the backup request tool group according to the first manufacturing plan.

13. The system of claim 9, further comprising means for determining a backup supply tool group and a backup supply
5 provided therefrom according to the first manufacturing plan, the backup demand, and the master production schedule.

14. The system of claim 9, further comprising means for allocating each tool of the backup supply tool group an equal share of workload gained in the backup operation.

10 15. The system of claim 9, further comprising means for introducing a simulated backup tool, having capacity equaling backup capacity received from the backup supply tool group, to the backup request tool group.

16. A backup planning method, scheduling backup
15 operations in a manufacturing system, wherein the manufacturing system comprises a plurality of manufacturing facilities, each of which comprises a plurality of tool groups, and each tool group comprises a plurality of tools, the method comprising:

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providing first capacity information, a master production

schedule, and a WIP profile of the tool group;

assigning a virtual tool to each of the tool groups;

combining capacity of the virtual tool into the first

5 capacity information of the tool group to generate

second capacity information thereof accordingly;

determining a first manufacturing plan for the tool group

according to the master production schedule, the WIP

profile and the second capacity information thereof;

10 and

determining a second manufacturing plan according to the

workload allocation of the virtual tool in the first

manufacturing plan.

17. The method of claim 16, wherein the virtual tool has
15 an unlimited capacity and is the least preferred tool in the tool
group.

18. The method of claim 16, further determining a backup
request tool group according to workload allocation of the
virtual tool specified in the first manufacturing plan.

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19. The method of claim 16, further determining a backup demand, equaling to the workload allocation of the virtual tool, of the backup request tool group according to the first manufacturing plan.

5 20. The method of claim 16, further determining a backup supply tool group and a backup supply provided therefrom according to the first manufacturing plan, the backup demand, and the master production schedule.

21. The method of claim 16, further allocating each tool
10 of the backup supply tool group an equal share of workload gained in the backup operation.

22. The method of claim 16, further introducing a simulated backup tool, having capacity equaling backup capacity received from the backup supply tool group, to the backup request
15 tool group.

23. The method of claim 16, wherein the tool is a semiconductor manufacturing tool.

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24. A computer readable storage medium for storing a computer program providing a backup planning method implemented in a manufacturing system, wherein the manufacturing system comprises a plurality of manufacturing facilities, each of which
5 comprises a plurality of tool groups, and each tool group comprises a plurality of tools, the method comprising:

receiving first capacity information, a master production schedule, and a WIP profile of the tool group;

assigning a virtual tool to each of the tool groups;

10 combining capacity of the virtual tool into the first capacity information of the tool group to generate a second capacity information thereof accordingly;
and

determining a first manufacturing plan for the tool group

15 according to the master production schedule, the WIP profile, and the second capacity information thereof.

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25. The storage medium of claim 24, wherein the virtual tool has an unlimited capacity and is the least preferred tool in the tool group.

26. The storage medium of claim 24, further determining
5 a backup request tool group according to workload allocation of the virtual tool specified in the first manufacturing plan.

27. The storage medium of claim 24, further determining a backup demand, equaling to the workload allocation of the virtual tool, of the backup request tool group according to the
10 first manufacturing plan.

28. The storage medium of claim 24, further determining a backup supply tool group and a backup supply provided therefrom according to the first manufacturing plan, the backup demand, and the master production schedule.

15 29. The storage medium of claim 24, further allocating each tool of the backup supply tool group an equal share of workload gained in the backup operation.

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30. The storage medium of claim 24, further introducing a simulated backup tool, having capacity equaling backup capacity received from the backup supply tool group, to the backup request tool group.